

**Appendix D**  
**Wastewater Design Criteria and Examples Matrix Summary from Non-Military**  
**Sources**

**Table D-1**  
**Conventional Wastewater Treatment - Preliminary, Sedimentation, and Biological Processes**

Topic	Reference					
	Theory and Practice of Water and Wastewater Treatment, John Wiley, 1997	Unit Operations and Processes in Environmental Engineering, PWS Publishing, 1995	Environmental Science and Engineering, Prentice-Hall, 1996	Wastewater Engineering: Treatment, Disposal and Reuse, McGraw-Hill, 1991	Design of Municipal Wastewater Treatment Plants, WEF/ASCE, 1992	Domestic Wastewater Treatment, TM 5-814-3
Screens	Chapter 11 (T)	Chapters 6, 7	--	Chapter 9 (T)	Chapter 9 (T)	--
Bar Racks	Chapter 11	Chapter 7 (E)	--	Chapter 9 (T)	Chapter 9 (T)	--
Barminuturs	--	Chapter 7	--	Chapter 9 (T)	Chapter 9 (T)	--
Comminution	Chapter 9	Chapter 7	--	Chapter 9	Chapter 9	--
Grit Removal	Chapter 11 (T), (E)	Chapter 7 (T), (E)	--	Chapter 9 (T)	Chapter 9 (T)	--
Mechanical	Chapter 11 (T), (E)	Chapter 7 (T), (E)	--	Chapter 9 (T)	Chapter 9	--
Aerated	Chapter 11 (T)	Chapter 7 (T), (E)	--	Chapter 9 (T), (E)	Chapter 9	--
Flow Equalization	Chapter 9, 10	Chapter 7 (T), (E)	--	Chapter 9	Chapter 9	--
Imhoff Tank	Chapter 18	--	--	Chapter 14 (T)	Chapter 10 (T)	--
Conventional Sedimentation	Chapter 11 (T), (E)	Chapter 9 (T), (E)	Chapter 12 (T), (E)	Chapter 9 (T), (E)	Chapter 10	--
Chemical Precipitation	--	--	--	--	Chapter 10 (T)	--
Enhanced Coagulation	--	--	--	--	Chapter 10 (T)	--
Trickling Filter	Chapter 17 (T)	Chapter 17 (T), (E)	Chapter 12 (T), (E)	Chapters 8, 10 (T), (E)	Chapter 12 (T), (E)	Chapter 7 (E)
Oxidation Ditches (CLR)	--	Chapter 15 (T), (E)	--	--	Chapter 11 (T)	Chapter 13 (T), (E)
Rotating Biological Contactors	--	Chapter 17 (E)	--	Chapter 10 (T), (E)	Chapter 12 (T), (E)	--
Sequencing Batch Reactors	Chapter 17 (E)	Chapter 3 (E)	--	Chapter 10 (T), (E)	--	--
Sludge Pumping System	--	--	--	Chapter 12 (T), (E)	Chapter 17	Chapter 16 (T), (E)
Sludge Pumping Scum	--	--	--	Chapter 10 (T)	--	Chapter 6
Effluent Design	--	--	--	Chapter 10 (T)	--	Chapter 6
(T)	Design criteria table(s) provided					
(E)	Design example(s) provided					

Topic	Reference						
	Theory and Practice of Water and Wastewater Treatment John Wiley, 1997	Unit Operations and Processes in Environmental Engineering PWS Publishing, 1995	Environmental Science and Engineering Prentice-Hall, 1996	Wastewater Engineering: Treatment, Disposal and Reuse McGraw-Hill, 1991	Design of Municipal Wastewater Treatment Plants WEF/ASCE, 1992	Domestic Wastewater Treatment TM 5-814-3	Dewatering Municipal Wastewater Sludges Design Manual, September 1987 EPA/625/1-87-014
Anaerobic Sludge Digestion	Chapter 18 (T)	Chapter 19 (T), (E)	Chapter 12 (T), (E)	Chapters 8, 12 (T), (E)	Chapter 18 (T)	Chapter 16 (T), (E)	--
Aerobic Sludge Digestion	Chapter 18 (T)	Chapter 20 (T), (E)	--	Chapters 8, 12	Chapter 18 (T)	--	--
Sludge Handling	--	--	--	--	--	--	--
Sludge Disposal Regulations	--	--	--	--	--	--	--
Sludge Handling, Treatment, and Disposal	Chapter 20 (T), (E)	Chapter 21 (T), (E)	--	Chapter 12 (T), (E)	Chapter 12 (T)	Chapter 16 (E)	Chapters 3, 5, 6, 7 (T), (E)
Sludge: Regulation Considerations	Chapter 10 (T)	Chapters 1, 2, 3, 4, 5 (T), (E)	Chapters 2, 3, 4 (T)	Chapters 4, 5, 6, 9, 10 (T), (E)	Chapter 12 (T)	Chapters 1, 2, 3 (T)	--

(T) Design criteria table(s) provided  
(E) Design example(s) provided

**Table D-3**  
**Small Wastewater Treatment Systems**

Topic	Reference							
	Wastewater Engineering: Treatment, Disposal and Reuse McGraw-Hill, 1991	Appropriate Technology for Treating Wastewater at Remote Sites, CERL, 1984	Septic Systems Handbook, 1987 Lewis Publishers	Mound Systems: Design Module Number 9, NSFC, 1990	Mound Systems Pressure Distribution of Wastewater Ohio State Univ., 1992	Onsite Wastewater Treatment Systems Hogarth House, 1994	Design of Municipal Wastewater Treatment Plants WEF/ASCE, 1992	Onsite Wastewater Treatment and Disposal Systems, October 1980 EPA/625/1/80/012
Septic Tank System	Chapter 14 (T), (E)	Chapter 14 (T), (E)	Chapter 2	--	--	Chapter 7 (T), (E)	--	Chapter 6
Grease and Oil Interception Tanks	Chapter 14	--	--	--	--	--	--	--
Imhoff Tanks	Chapter 14	--	--	--	--	--	--	--
Intermittent Sand Filter	Chapter 14 (T), (E)	Chapter 14 (T), (E)	Chapter 13	--	--	--	--	--
Absorption (Disposal) Fields	Chapter 14 (T), (E)	--	Chapter 2	--	--	Chapter 7 (T)	--	Chapter 7 (T), (E)
Mound System	Chapter 14	Chapter 14	--	Chapter 1 (T), (E)	Chapter 1 (T), (E)	Chapter 7 (T)	--	Chapter 7 (T), (E)
Pit Privy	--	--	--	--	--	--	Chapter 5	--
Vault Toilets and Aerated Vault Latrines	--	--	--	--	--	--	Chapter 4	--
Composting Toilets	--	--	--	--	--	--	Chapter 2	--
Contact Stabilization	Chapter 14	--	--	--	--	--	--	--

(T) Design criteria table(s) provided

(E) Design example(s) provided

(Continued)

**Table D-3 (Concluded)**

Topic	Reference						
	Wastewater Engineering: Treatment, Disposal and Reuse McGraw-Hill, 1991	Wastewater Treatment and Disposal for Small Communities September 1992 EPA/625/R-92/005	Small Community Water and Wastewater Treatment September 1992 EPA/625/R-92/010	Mound Systems: Design Module Number 9 NSFC, January 1990	Mound Systems Pressure Distribution of Wastewater Ohio State Univ., 1992	Alternative Wastewater Collection Systems October 1991 EPA 625/1-91/024	Domestic Septage Guidance September 1993 EPA/832/B-92/005
Wastewater Collection Systems	Chapter 11	--	--	--	--	--	--
Pressure Sewers	Chapter 14 (T)	(T)	(T)	--	--	Chapters 2, 5 (T), (E)	--
Vacuum Sewers	Chapter 14 (T)	(T)	(T)	--	--	Chapters 3, 5 (T), (E)	--
Small Diameter Gravity Sewers	--	(T)	(T)	--	--	Chapters 4, 5 (T), (E)	--
Physical-Chemical Treatment	Chapter 14	--	--	--	--	--	--
Package Plants	Chapter 14 (T), (E)	--	(T)	--	--	--	--
Lagoons (Ponds)	--	(T)	(T)	--	--	--	--
Land Treatment Methods	--	(T)	(T)	--	--	--	--
Submerged Bed Constructed Wetlands	--	(T)	(T)	--	--	--	--
Septage Holding Tank or Station	Chapter 14	--	--	--	--	--	--
Septage and Septage Disposal	Chapter 14 (E)	(T)	--	--	--	--	Chapters 2, 3, 4 (T)
Effluent Disposal Options	Chapter 14	--	--	--	--	--	--
Sludge Treatment	--	(T)	(T)	--	--	--	--
Effluent Treatment	--	--	(T)	--	--	--	--

T = Design criteria table(s) provided  
E = Design example(s) provided

		Reference							
Topic	Unit Operations and Processes in Environmental Engineering 1995 PWS Publishing	Wastewater Engineering: Treatment, Disposal and Reuse McGraw-Hill, 1991	Theory and Practice of Water and Wastewater Treatment John Wiley, 1997	Theory and Practice of Water and Wastewater Treatment, 400/S-90/011 EPA, July 1990	Natural Systems for Wastewater Treatment WEF 1990	Constructed Wetlands and Aquatic Plant Systems for Municipal Wastewater Treatment, 625/1-88/022 EPA, Sept. 1988	Water Treatment and Disposal for Small Communities, 625/R-92/005 EPA, Sept. 1992	Summary Report Small Community Water and Wastewater Treatment, EPA, Sept. 1992	Subsurface Flow Constructed Flow Constructed Wetlands for Wastewater Treatment, 832/R-93/008 EPA, July 1993
Constructed Wetlands - Aquatic Plant Systems	--	--	--	--	--	Chapter 4 (T)	--	--	--
Constructed Wetlands-Subsurface Flow	--	--	--	--	--	--	--	--	Chapter 4 (T)
Constructed Wetlands - Wetland Types	--	--	--	Chapter 3 (T)	Chapter 9 (T)	--	--	--	--
Floating Aquatic Plant Treatment	--	Chapter 13 (T)	--	--	Chapter 8 (T)	Chapter 13 (T)	--	--	--
Land Application - Overland Flow	Chapter 22 (T), (E)	Chapter 13 (E)	Chapter 19 (T)	--	--	--	Chapter 5 (T)	Chapter 1 (T)	--
Land Application - Rapid Infiltration	--	--	--	--	--	--	Chapter 5 (T)	Chapter 1 (T)	--
Land Application - Slow Rate	Chapter 22 (T), (E)	Chapter 13 (T), (E)	Chapter 19 (T)	--	--	--	Chapter 5 (T)	Chapter 1 (T)	--
Stabilization Ponds or Aerobic Lagoons	Chapter 18 (E)	Chapters 8, 10 (T), (E)	Chapter 19 (T)	--	--	--	--	--	--
Stabilization Ponds or Anaerobic Lagoons	--	Chapters 8, 10 (T), (E)	Chapter 19 (T)	--	--	--	--	--	--
Stabilization Ponds or Facultative Lagoons*	--	Chapters 8, 10 (T), (E)	Chapter 19 (T)	--	--	Chapter 13	--	--	--
Subsurface Wastewater Infiltration System	--	--	--	--	Chapter 3 (T)--	--	--	--	--
(T)	Design criteria table(s) provided								
(E)	Design example(s) provided								
*	Aerobic - Anaerobic								

(T)	Design criteria table(s) provided
(E)	Design example(s) provided
*	Aerobic - Anaerobic

**Table D-5**  
**Effluent Disinfection Design Criteria and Examples**

Topic	Reference				
	Theory and Practice of Water and Wastewater Treatment John Wiley, 1997	Unit Operations in Environmental Engineering PWS Publishing, 1995	Environmental Science and Engineering Prentice-Hall, 1996	Wastewater Engineering: Treatment, Disposal and Reuse McGraw-Hill, 1991	Design of Municipal Wastewater Treatment Plants WEF/ASCE, 1992
Effluent Disinfection-Chlorination	Chapter 16	Chapter 24	Chapter 12	Chapter 7	Chapter 14
Effluent Disinfection-Ozonation	Chapter 16	Chapter 24	Chapter 12	Chapter 7	Chapter 14
Effluent Disinfection-Ultraviolet	Chapter 16, (T), (E)	Chapter 24	Chapter 12	Chapter 7	Chapter 14
(T) Design criteria table(s) provided					
(E) Design example(s) provided					